

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

ELLIS et al

Atty. Ref.: 608-312

Serial No. Unassigned

Group:

Filed: September 28, 2001

Examiner:

For: OXIDATION PROCESS FOR THE PRODUCTION OF ALKENES AND
CARBOXYLIC ACIDS

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September 28, 2001

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

In order to place the above-identified application in better condition for
examination, please amend the application as follows:

IN THE CLAIMS

Please substitute the following amended claims for corresponding claims
previously presented. A copy of the amended claims showing current revisions is
attached.

4. (Amended) A process as claimed in claim 1 which the molar ratio of
alkene to carboxylic acid produced in the oxidation reaction zone is in the range

10:1 to 1:10.

6. (Amended) A process as claimed in claim 2 in which alkene and/or carboxylic acid is separately recovered from the oxidation reaction product or separately added to the second reaction zone.

7. (Amended) A process as claimed in claim 1 in which the alkane is ethane, the corresponding alkene being ethylene and the corresponding carboxylic acid being acetic acid.

10. (Amended) A process according to claim 8 and wherein the molar ratio of alkene to carboxylic acid produced in the oxidation reaction zone is in the range 0.8: 1 to 1.4:1.

11. (Amended) A process according to claim 1 wherein the concentration of alkene fed to the oxidation reaction zone is from greater than 0 and up to and including 50 mol% of the total feed, including recycles.

12. (Amended) A process according to claim 1 wherein the concentration of water fed to the oxidation reaction zone is from 0 to 50 mol% inclusive of the total feed, including recycles.

13. (Amended) A process according to wherein alkene and water are fed into the oxidation reaction zone.

14. (Amended) A process according to claim 1 wherein the alkene and water are fed into the oxidation reaction zone in an alkene : water ratio of 1 to 0.1-250 by weight.

17. (Amended) A process according to claim 1 in which the at least one catalyst in the oxidation reaction zone comprises molybdenum.

19. (Amended) A process according to claim 1 in which the oxidation reaction is carried out at a temperature in the range 100 to 400 °C

20. (Amended) A process according to in which the oxidation reaction is carried out at atmospheric or superatmospheric pressure

21. (Amended) A process according to in which the oxidation reaction is carried out at a GHSV of 500-10,000 hr⁻¹.

22. (Amended) A process according to claim 1 wherein the product stream from the oxidation reaction zone also comprises carbon oxides in an amount of less than 15 mol%.

23. (Amended) A process according to in which the alkane is ethane, the corresponding alkene is ethylene, the corresponding carboxylic acid is acetic acid and wherein ethylene and water are fed into the oxidation reaction zone in a ratio of 1 to 0.1-10 by weight, the molar ratio of ethylene to acetic acid produced is in the range 0.8:

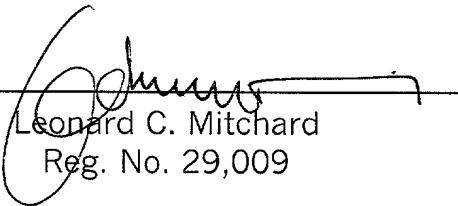
REMARKS

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

4. (Amended) A process as claimed in [any one of the preceding claims] claim 1 which the molar ratio of alkene to carboxylic acid produced in the oxidation reaction zone is in the range 10:1 to 1:10.

6. (Amended) A process as claimed in [any one of claims 2 to 3] claim 2 in which alkene and/or carboxylic acid is separately recovered from the oxidation reaction product or separately added to the second reaction zone.

7. (Amended) A process as claimed in [any one of claims 1 to 3] claim 1 in which the alkane is ethane, the corresponding alkene being ethylene and the corresponding carboxylic acid being acetic acid.

10. (Amended) A process according to claim 8 [or claim 9] and wherein the molar ratio of alkene to carboxylic acid produced in the oxidation reaction zone is in the range 0.8: 1 to 1.4:1.

11. (Amended) A process according to [any one of claims 1 to 3] claim 1 wherein the concentration of alkene fed to the oxidation reaction zone is from greater than 0 and up to and including 50 mol% of the total feed, including

recycles.

12. (Amended) A process according to [any one of claims 1 to 3] claim 1 wherein the concentration of water fed to the oxidation reaction zone is from 0 to 50 mol% inclusive of the total feed, including recycles.

13. (Amended) A process according to [any one of claims 1 to 3] wherein alkene and water are fed into the oxidation reaction zone.

14. (Amended) A process according to [any one of claims 1 to 3] claim 1 wherein the alkene and water are fed into the oxidation reaction zone in an alkene : water ratio of 1 to 0.1-250 by weight.

17. (Amended) A process according to [any one of claims 1 to 3] claim 1 in which the at least one catalyst in the oxidation reaction zone comprises molybdenum.

19. (Amended) A process according to [any one of claims 1 to 3] claim 1 in which the oxidation reaction is carried out at a temperature in the range 100 to 400 °C

20. (Amended) A process according to [any one of claims 1 to 3] in

which the oxidation reaction is carried out at atmospheric or superatmospheric pressure

21. (Amended) A process according to [any one of claims 1 to 3] in which the oxidation reaction is carried out at a GHSV of 500-10,000 hr⁻¹.

22. (Amended) A process according to [any one of claims 1 to 3] claim 1 wherein the product stream from the oxidation reaction zone also comprises carbon oxides in an amount of less than 15 mol%.

23. (Amended) A process according to [any one of claims 1 to 3] in which the alkane is ethane, the corresponding alkene is ethylene, the corresponding carboxylic acid is acetic acid and wherein ethylene and water are fed into the oxidation reaction zone in a ratio of 1 to 0.1-10 by weight, the molar ratio of ethylene to acetic acid produced is in the range 0.8: